SURVIAC Bulletin

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Survivability/Vulnerability Information Analysis Center

SURVIAC is a U.S. Department of Defense Information Analysis Center (IAC) sponsored by the Defense Information Systems Agency (DISA), Defense Technical Information Center (DTIC).

F/A-22 Live Fire Repair

by TSgt Renee Daig, F/A-22 ABDR Program Manager

TSgt Tim Fugere (649th CLSS), TSgt RIchard Cousineau, and SSgt Sean Dolney (653rd CLSS) perform fastener removal on the upper wing structure.

Every major weapon system purchased by the USAF must pass a survivability, or "live fire", test. The third such live fire test for the F/A-22 program was conducted in Aug 01 on the left wing of Air Vehicle 4001, the first EMD aircraft. This test, conducted at the 46th Test Wing's firing range in Area B, consisted of firing a high explosive incendiary round through the wing while simultaneously subjecting the wing to high-speed airflow and fuel pressure. The design of the F/A-22 wing structure passed the live fire test with flying colors. The damage incurred by the wing was much less than originally anticipated and the structure successfully passed a residual loads test. Future live fire tests are scheduled for the wing structure. However, before the 46th Test Wing can proceed with the next shot, the damaged wing must be repaired so that it can hold fuel.

Since DoD regulations state a particular objective of Live Fire Test & Evaluation is to assess battle damage repair capabilities and issues, the F/A-22 System Program Office (SPO) saw this repair action as an ideal opportunity to conduct an Aircraft Battle Damage Repair (ABDR) demonstration. Not only will the ABDR demonstration reseal the wing structure for future use, it will also allow the end user of ABDR, Air Force Materiel Command, to validate techniques and training in the development of an ABDR capability for the F/A-22 program.

The main objective of the repair demonstration, besides restoring fuel-carrying capability to the wing, is to restore sufficient structural integrity to the test article, using standard ABDR techniques, such that it could accomplish a one-time ferry flight. A ferry flight, the initial ACC requirement for the F/A-22 ABDR program, could involve a flight from a forward operating base or other austere location back to a main operating base. It could also entail a flight from a main operating base to a location more suitable for depot level maintenance actions. The type of repair implemented for a ferry flight returns only the minimum capability needed to make the aircraft flight-worthy, is the most expedi-

TSgt David Keiser from the AF ABDR Program Office drills holes for the wings internal structural repair.

F/A-22 Live Fire Repart continued on page 4

Report Documentation Page

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In This Issue:

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Fare Thee Well...

Mr. Ralph Lauzze has recently retired from government service. The survivability community has long recognized Ralph for his technical expertise, his key leadership, and as a friend and general good guy. Ralph came to government civil service thirty years ago with ready survivability and test experience from the United States Air Force. Over his career he has helped pioneer both improved testing techniques for full scale live fire test and structural loads use of modeling and simulation, and new survivability technologies such as fuel tank and dry bay fire protection. The results of Ralph's work have lead to more survivable design of several aircraft including A-7, A-10, C-17, C-130, AC-130, F-4, F-15, F-16, F/A-22, B-1 and B-2. He has been a key advisor at senior levels of both the Air Force and Office of the Secretary of Defense (OSD). Ralph's technical expertise coupled with his high integrity and wisdom has lead to his being consulted on key live fire test issues — often by both opposing sides of critical issues. Ralph was also asked to testify about the TWA 800 crash before the National Transportation Safety Board, due to his expertise in fire and explosion. As well as Ralph is known and respected for his technical knowledge, it is his leadership that will be most missed. Ralph has served in numerous key leadership positions over the past two decades. He provided key start up vision and direction as the Joint Live Fire Director. He has also chaired the Joint Technical Coordinating Group on Aircraft Survivability (JTCG/AS), lead the Joint Aircraft Survivability to MANPADS (JASMAN) and even served as COTR for SURVIAC.

Over his career, Ralph has received numerous awards both from the Air Force and from Joint Agencies including the Meritorious Civilian Service Award, Outstanding Civil Career Service Award, Exemplary Civil Service Award, and the NDIA Combat Survivability Division's Survivability Leadership Award and the Courtland Award for Engineering Excellence.

To all this, we at SURVIAC add our sincere appreciation for his efforts, leadership, and friendship over the years. We wish Ralph all the best in his new career.

(Left) Ralph Lauzze is presented an award by Dr. David Jerome, Chief, 46 OG, at his retirement ceremony at Wright-Patterson AFB, Ohio.

(Above) Ralph addressing his co-workers and friends.

Ralph Lauzze Retires

F/A-22 Live Fire Repair continued from page 1

tious repair option and requires the least labor, tools and materials. Typically, no consideration is given to restoration of Low Observable (LO) capabilities for a ferry flight repair given that the aircraft will not be operating in a combat role.

Repair of the F/A-22 wing, a high-performance structure consisting primarily of composite and titanium spars and skins, is a complicated undertaking. Lockheed Martin is in the process of developing an F/A-22 ABDR program, however, there is no official technical data yet available. Repairs have been developed in the past for other weapons systems with similar structural compositions. However, few have been developed for advanced composites matrix systems like those used for the F/A-22. The current demonstration will allow Lockheed Martin and USAF ABDR experts to glean data needed to facilitate the development of F/A-22 ABDR repairs.

To make the demonstration happen, the F/A-22 SPO called in the experts - the AF ABDR Program Office and the active-duty Combat Logistics Support Squadrons (649th, 653rd and 654th) of each Air Logistics Center. Personnel from each of these units were tapped to participate as part of the repair team. The team will consist of blue-suit Aircraft Structural Maintenance Craftsman experienced in ABDR and the repair of advanced composite materials, as well as active duty ABDR engineers. Repair instructions and designs were developed in-house by ABDR engineers and will be executed by the technicians on-base at the 46th Test Wing's live fire test facility. It is anticipated that the repair demonstration will take approximately one week to complete and will save the USAF an estimated $2M.

"This repair would not be possible without the cooperative effort of several organizations. The 46th Test Wing Aerospace Survivability and Safety Flight has made their facilities and resources available for our use. We are implementing repairs based on research developed by the Air Force Research Laboratory's Materials and Manufacturing Directorate. Engineers from the AFRL Advanced Composites Office and Aeronautical Systems Center are providing valuable engineering expertise. We are learning valuable lessons every day on what types of tools, training, and technical data are required to guarantee AFMC's ability to continue combat repair and support to the operators for next generation aircraft." Captain Josh Boatwright, USAF Chief ABDR Engineer.

TSgt Tim Fugere (649th CLSS), TSgt Richard Cousineau, and SSgt Sean Dolney (653rd CLSS) manufacture parts to repair the F/A-22 wing structure.

Component Vulnerability Analysis Archive (CVAA) Entered Into SURVIAC

At the May 2002 SURVIAC Technical Coordinating Group (TCG) meeting the first release version (5.0) of the Component Vulnerability Analysis Archive (CVAA) was approved for entry into SURVIAC. The SURVIAC product, consisting of the unclassified CD ROM with version 5.0 and the notes from the 11 December 2001 CVAA Workshop will cost $300 for contractors. There will be no cost for government agencies.

The CVAA is a jointly funded effort by the JTCG/AS and JTCG/ME and is a database of component and systems nonnuclear vulnerability analyses, supporting test data and associated reports and data. It is organized into Systems and Component trees with the Systems tree containing descriptions and vulnerability data on aircraft, ground vehicles and ships. The Component tree contains similar data on critical components such as fuel systems, stores and engines for aircraft, ground vehicles and facilities and ships. It also contains a bibliography of associated reports and SURVIAC Vault Numbers.

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Threat Warheads and Effects/Battle Damage Assessment and Repair Archival and Retrival (TWE/BDAR) System Entered Into SURVIAC

At the May 2002 TCG meeting the first release version (1.1) of the Threat Warheads and Effects/Battle Damage Assessment and Repair (TWE/BDAR) Archival and Retrieval (A&R) System was approved for entry into SURVIAC. The SURVIAC product, consisting of the unclassified two-set CD ROM with version 1.1, Image Library and help documentation will cost $300.

TWE/BDAR was a Live Fire Test and Training (LFT&T) funded effort and is an archival and retrieval system of threat warheads and effects and battle damages and repairs of component and systems nonnuclear vulnerability analyses, supporting test data and associated reports and data.

The objective of this project was to provide an efficient and effective method to capture, distribute, and use Joint Live Fire (JLF) and Live Fire Test (LFT) information to enhance the proficiency of the combat maintainers and operators through realistic training and instruction. The focus of the project was to identify, formulate, and implement concepts for information application in such areas as course and courseware development, visual aids, instruction, training, and field application. This project was a joint effort between the US Air Force (USAF) and US Army (USA) and was managed by the Air Force Agency for Modeling & Simulation (AFAMS).

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Directed Energy Effectiveness Modeling State-of-the-Art Report (SOAR) Entered Into SURVIAC

The SURVIAC has recently completed a State-of-the-Art Report (SOAR) on Directed Energy Weapon (DEW) assessment methods. The SOAR was written to provide the vulnerability analyst with an overview of existing methodologies and models used to estimate the effectiveness of both laser and High Power Microwave (HPM) weapon systems and concepts.

In recent years, interest in DEW systems has risen for several reasons:

- DEW systems are a good complement to existing weapon systems.
- Propagation times to potential targets are short (e.g., at the speed of light).
- Optical systems and electronics are very sensitive to electromagnetic (EM) radiation.
- Electronic upset can lead to mission kills.
- Potential exists to vary output power levels and control beam size to minimize collateral damage effects and tailor effects on targets.

There is also an interest in protecting sensitive components from DEW sources.

The use of lasers as range finders, illuminators and diagnostic devices in both military and civilian sectors has caused concern over potential eye damage. There is also concern in the T&E community on how to safely test developmental DEW systems.

The report provides an overview of the desired elements of a general DEW effectiveness methodology as shown in Figure 1. Included is a discussion of lasers in detail with comments on each of the required elements as shown in Figure 1.

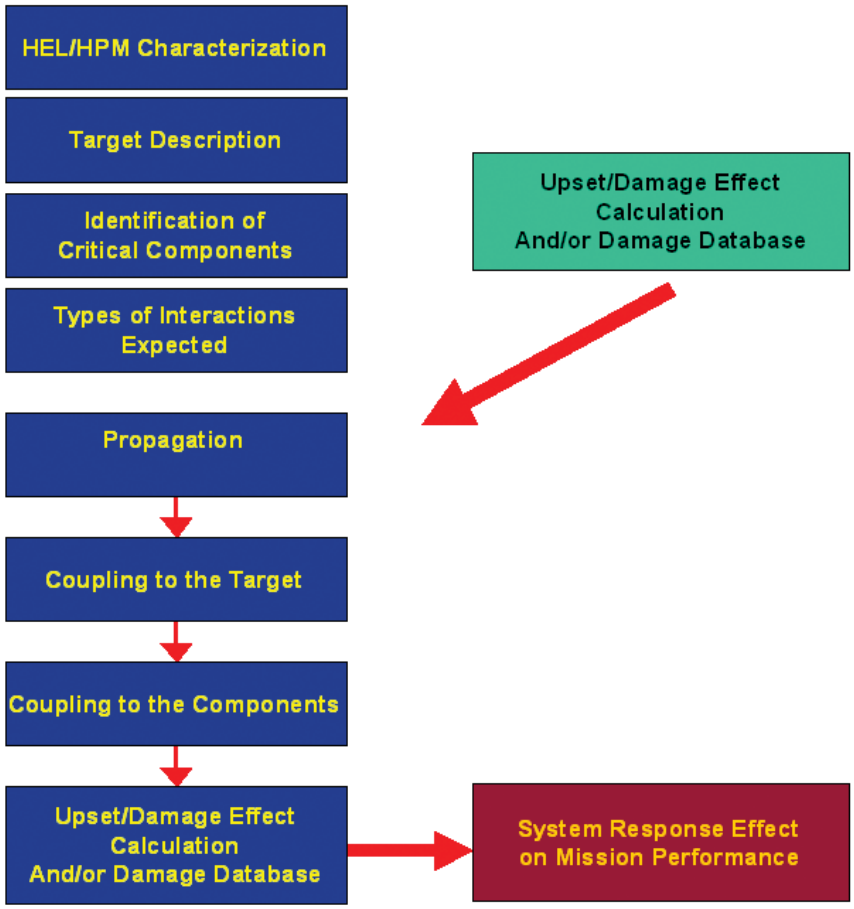

Fig. 1: Required Elements of a General DEW Effectiveness Methodology.

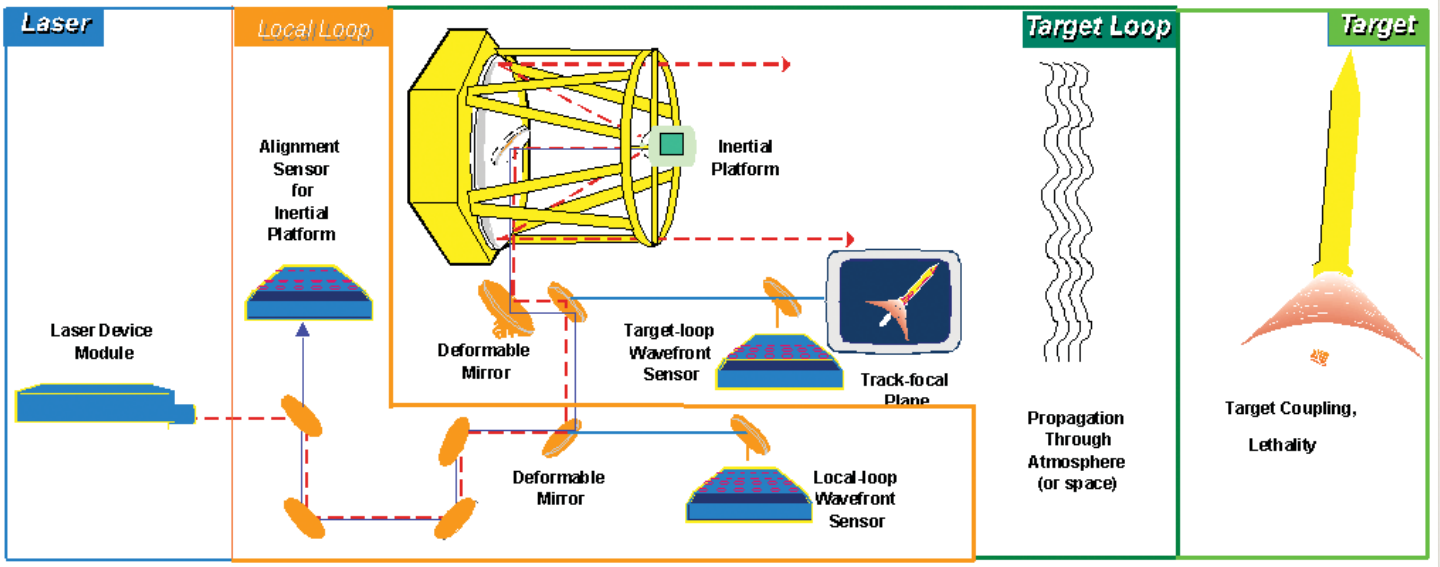

Fig. 2: Schematic Diagram of an HEL Weapons System.

Figure 2 shows schematically a conceptual High Energy Laser (HEL) System. Target tracking, beam steering, atmosphere compensation and target coupling are affects which must be considered.

The report discusses current laser models and laser modeling and simulation development efforts being conducted by the services. In addition, high-energy laser test facilities and laser vulnerability data basing efforts are discussed. Much of this information was generated by interviewing and meeting with recognized experts in the laser field and a listing of laser points of contact is provided in the SOAR.

The SOAR also discusses high power microwaves (HPM) and the methodology requirements unique to HPM systems. Included are descriptions of service modeling and simulation efforts and HPM effects research programs. Current HPM models are described in some detail. The report also describes service HPM test facilities, HPM vulnerability databases, and HPM expert points of contact.

The SOAR contains conclusions/recommendations for both lasers and HPM. No overall general model was found that addressed all elements of the DEW effectiveness methodology outlined in Figure 1. However, there are a few specialized models that characterize effects on specific target sets (e.g., sensors and ballistic missiles).

The report contains over 70 references, which can provide the reader with detailed information on various topics related to DEW modeling and effectiveness assessments.

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New BRL-CAD User Documentation Published

The U.S. Army Research Laboratory (ARL) has recently published Volumes I and II of the BRL-CAD Tutorial Series. The series is part of an ongoing effort to provide on-line and hard-copy documentation for users of the BRL-CAD modeling software.

BRL-CAD is the Army's third-generation constructive solid geometry (CSG) modeling package that is used to support ballistic and electromagnetic analyses of combat vehicle systems and their environments, as well as various other engineering and graphics applications. Now licensed at more than 2,000 sites throughout the world, the package provides the ability to build and analyze models of complex objects by manipulating a relatively small set of primitive shapes with the basic Boolean operations of union, subtraction, and intersection.

Volume I of the Tutorial Series, the "Overview and Installation" guide, begins with a brief discussion on the history and philosophy of the package, which was first developed in 1979 by ARL's predecessor, the Ballistic Research Laboratory (BRL). The volume continues with a discussion of BRL-CAD's tools, utilities, and libraries. They include an interactive geometry editor, raytracing programs and libraries, network-distributed processing and framebuffer libraries, image- and signal-processing tools, and the Tcl/Tk and [incr Tcl] scripting languages.

The volume also contains extensive, platform-specific instruction on obtaining and installing the package, which is available as a free distribution (without support) and as a full-service distribution (administered through the SURVIAC Aberdeen Satellite Office [ASO]).

Volume I concludes with information on benchmark testing, troubleshooting and tracking bugs, and new releases.

Volume II, the "Introduction to MGED," provides basic instruction in the use of the Multi-Device Geometry Editor (MGED), which is at the heart of the BRL-CAD package. MGED offers both graphical user interface (GUI) and command-line formats for building and analyzing geometric objects.

The first 16 chapters are written primarily for the novice user. They provide progressively challenging modeling exercises and offer practical insights into working with primitive shapes; viewing, building, and structuring geometry; assigning material properties; and raytracing.

Also included in Volume II are several appendices that can serve as useful references for all BRL-CAD users, regardless of

BRL-CAD continued on page 9

ALARM 4.4.1 Released

SURVIAC in coordination with the Joint Technical Coordination Group on Aircraft Survivability is pleased to announce the availability of the official release of the Advanced Low Attitude Radar Model (ALARM) version 4.4.1.

ALARM is a generic digital computer simulation designed to evaluate the performance of a ground-based radar system attempting to detect low altitude aircraft. ALARM is an integration period model (i.e., the detection performance of the radar is determined over one integration period). ALARM can simulate pulsed, MTI, and pulse Doppler type radar systems. A limited capability to model CW radars is also available.

ALARM can model the elevation scan coverage of the antenna beam by specifying a minimum and maximum elevation angle. This can in effect simulate a continuously scanning or tracking beam. This capability can be used to closely simulate a stepped scan radar with the assumption that the target is always detected by the peak of the beam. There are no provisions, however, for changing the radar and/or antenna characteristics as the beam scans. Actual two- or three dimensional radar antenna gain pattern data can be loaded.

ALARM can operate in either a flight path analysis (FPA) mode, a horizontal detection contour (HDC) mode, a vertical coverage envelope (VCE) mode or a vertical detection contour (VDC) mode. In the FPA mode, ALARM requires aircraft flight data parameters to be input, and detection is determined for each data point. For each data point, the following aircraft flight data parameters must be specified: altitude; heading; speed; bank; and pitch. Models such as BLUEMAX can be used to generate the aircraft flight profiles for input to ALARM. The HDC mode is used to more generically illustrate a radar's detection performance. ALARM, in HDC mode, generates multiple north to south straight-line flight paths going from left to right across the radar site. A single aircraft speed and altitude are entered, and the aircraft is assumed to fly straight and level (pitch and roll cannot be specified). The VCE mode

ALARM continued on page 10

BRL-CAD continued from page 8

their level of experience. These appendices include a comprehensive list of MGED user and developer commands and the required input parameters for all of the principal primitive shapes.

ARL is currently distributing both volumes in hard-copy format. In addition, electronic versions are available for download at the BRL-CAD website (http://ftp.arl.army.mil/brlcad).

Future volumes of the series are currently in development. They are planned to address advanced modeling techniques as well as more sophisticated BRL-CAD features and topics.

For more information on the BRL-CAD Tutorial Series, contact Eric Edwards at the SURVIAC ASO at (410) 273-7794 or eric@survice.com.

For BRL-CAD technical assistance, questions can be directed to the SURVIAC ASO or posted to the BRL-CAD mailing list (cad@arl.army.mil).

ALARM continued from page 9

computes the radar's outer detection envelope for round smooth earth cases. The VDC mode computes the radar's detection contour. Actual aircraft radar cross section (RCS) data can be loaded for either the FPA or HDC modes. The model calculates the relative angular geometry from the radar to the target and looks up the corresponding RCS of the target.

The ALARM radar detection calculations are based on the signal-to-noise (S/N) radar range equations commonly used in radar analysis. The basic theory follows fairly closely to that discussed in commonly used radar text books such as "Radar Range Performance Analysis" and "Introduction To Radar Systems". The model includes the environmental effects of atmosphere, terrain masking, clutter, multipath, and electromagnetic propagation have been included through the use of the Common Modeling Component Set (CMCS).

Land clutter reflectivity probability distributions published by Massachusetts Institute of Technology (MIT) Lincoln Laboratory and sea clutter reflectivity probability distributions from the Center for Naval Analysis (CNA) are used in ALARM. Pattern propagation effects such as radar antenna pattern, spherical earth and knife edge diffraction, and multipath are included by use of the MIT Lincoln Labs Spherical Earth/Knife Edge (SEKE) Diffraction source code. Terrain masking is determined based on National Imagery and Mapping Agency (NIMA) data input into the model for a specific radar site area.

The ALARM detection results include the effects of MTI or pulse Doppler filtering for reduction of clutter returns. Filter effects such as blind velocities (Doppler) are considered, as well as other filter effects caused by the number of MTI delays and number of Doppler filters and filter characteristics. The effects due to pulse eclipsing/blanking, MTI range and azimuth gating, and pulse compression are included. In addition, ALARM supports limited modeling of onboard noise (self-screening) jammers, onboard deception (coherent) jammers, and standoff noise jammers.

Several updates have been made since the last version. The following is a recap of the new or updated features. A new input variable was added: FPA_MAX_RANGE. HdcChart can now create outline contour plots and color intensity plots. FpaChart can now create detection spike plots. A new utility program DiaryMerge was added and obsoletes PdMerge. DiaryMerge merges HDC, FPA, VDC or VCE diaries. The HDC and FPA diary file formats changed. A complete list of the changes can be found in the ALARM Version Description Document (VDD).

A Graphical User Interface has been added for ALARM users running Windows.

SURVIAC is now distributing the classified ALARM data sets. The data sets cover most radars. A classified list of radars is available upon request.

To request ALARM version 4.4.1 or the ALARM data sets, please contact Mrs. Geri Bowling at (937) 255-4840, DSN 785-4840 ext. 285, E-mail at gbowling@bah.com.

If you need additional technical information contact Mr. Barry Vincent at (937) 255-4840, DSN 785-4840 ext. 283, E-mail at vincent_barry@bah.com.

Quest for the Holy Grail

by Kevin Crosthwaite, SURVIAC Director

Recently I received an inquiry about survivability metrics. The caller wanted a list of "the" survivability numbers for all US and major foreign aircraft. As I questioned the caller, it became clear that they were looking for a single survivability number that captured the essence of survivability for each aircraft. They then hoped to be able to directly compare that number to analogous numbers for other platforms. A nice straight forward concept, however, the problem is such a single survivability number does not exist. My response to this requestor may be somewhat instructive.

First, I said if you take two of the same aircraft, equipped identically and have them fly the exact same mission, would you expect them to perform as effectively and survivably with US vs. Iraqi, vs. Israeli vs. Russian pilots? No, everyone expects the better trained pilots to perform better. As long as that is the case then survivability cannot just depend on just the platform. Similarly if you use the same platform and same pilot in different missions and scenarios, then the threats and risks are different. Also, new tactics and new ECM can help you survive better. The combination of other supporting aircraft for jamming, command and control, and SEAD can also yield a huge advantage over a single lone aircraft conducting a mission. Weather, terrain maskings, time of day and surprise of the defenses all can impact survivability. Survivability can be a complicated thing. Reducing all this dependence on disparate factors to a single number would entail numerous assumptions, limitations and conditions.

That's not to say there are not key survivability metrics. Many metrics are widely used. For vulnerability, a key measure is vulnerable area. But again, even at this sub metric level there are many variations. The vulnerable area of a specific aircraft changes with both the threat in question and with the aspect from which the threat approaches the plane. Similarly, for signature the radar cross section (RCS) is a key measure. Here again the RCS varies with threat radar frequency, polarization and aspect around the aircraft. As I relayed this information to the requestor I was uncertain if he appreciated the insight and education, or was just upset because I didn't have the answer for which he was looking.

So, is this survivability problem just too difficult? Is the idea of an Integrated Survivability Assessment (ISA), as one person said, the "Holy Grail" of analysis? The JTCG/AS was tasked to define and layout the procedures for an ISA. The JTCG/AS is sponsoring a task with SURVIAC to do just that. The objective is to be able to trade off and optimize the key aspects of survivability. Vulnerability and signature are certainly key facets of survivability to consider, but so are tactics, EW, mission planning, SEAD and situational awareness from C4ISR. Each of these factors must input into the analysis if we expect to quantify their respective benefit.

At this point in this ISA effort several things are clear. First, choosing the right set of survivability metrics is an important first step. Then the analysis tools to derive and utilize these metrics should be identified, modified, or created. A multilevel analysis will be required as results from one stage progress up the pyramid through engagement, mission, and possibly campaign analysis. Another fact that is clear is that this ISA process will never be a black box with a simple crank. An experienced survivability analyst will always be a key component of any ISA process. A final thought is also clear about ISAs. They will never yield a single survivability number.

The project is currently underway. Initial results are expected early next year. Wish us well on our quest.

Survivability Quest

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SURVIAC Product Availability

SURVIAC is a U.S. Department of Defense Information Analysis Center (IAC) sponsored by the Defense Technical Information Center (DTIC)

Products

Product	Classification	Reproduction & Handling Fee
A Critical Review of Graphite Epoxy Laser Damage Studies	SECRET	$ 50.00
A Summary of Aerospace Vehicle Computerized Geometric Descriptions for Vulnerability Analyses	Unclassified	$100.00 (Free to Gov't)
Advanced Materials for Enhanced Survivability	SECRET	$100.00
Aircraft Fuel System Fire and Explosion Suppression Design Guide	Unclassified	$150.00/3 Volumes
'Aircraft Survivability' Video	Unclassified	$ 50.00 or 30-Day Loan
Alternatives For Halon 1301 In Army Ground Vehicle Firefighting Systems	Unclassified	$250.00
An Overview of Laser-Induced Eye Effects	SECRET	$150.00
An Overview of Laser Technology and Applications	Unclassified	$ 50.00
'Battle Damage Repair of Composite Structures' Video	Unclassified	$ 75.00
Collection of Vulnerability Test Results for Typical Aircraft Systems and Components	CONFIDENTIAL	$150.00
Comparative Close Air Support Vulnerability Assessment Study - Executive Summary	SECRET	None (Gov't. Only)
Compendium of References for Nonnuclear Aircraft Survivability (A Supplement to MIL-HDBK-336)	Unclassified	$150.00
Component Vulnerability Analysis Archive (CVAA) and Workshop Notes	Unclassified	$300.00 (Free to Gov't)
Component Vulnerability (Pd/h) Workshop Component Pd/h Handbook w/addendum	SECRET	$200.00 (Free to Gov't)
Component Vulnerability Database Development - CD	SECRET	$100.00 (Free to Gov't)
Countermeasures Handbook for Aircraft Survivability (3 Volumes)	SECRET	$200.00 (Free to Gov't)
Critical Review and Technology Assessment (CRTA) for Soldier Survivability (SSv)	Unclassified	$ 50.00
'Designing for Survivability' Video	Unclassified	30-Day Loan
Directed Energy Effectiveness Modeling State-of-the-Art Report (SOAR)	Unclassified	$ 50.00
Gas Explosion Suppression Agent Investigation	Unclassified	$200.00
Gun and Missile Pedigree Threat Reports - CD	SECRET	$150.00
Joint Live Fire/Live Fire Test Program Catalogue, Version 3.1	Unclassified	$ 95.00
MANPADS Threat to Aircraft: A Vulnerability Perspective - Final Report	SECRET	$200.00
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Penetration Characteristics of Advanced Engine Materials	Unclassified	$100.00
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RADGUNS 1.8 Parametric Study	SECRET	$100.00 (Free to Gov't)
Ship Survivability Overview	Unclassified	$ 50.00
'SURVIAC - A Capabilities Overview' Video	Unclassified	30-Day Loan
Survivability Analysis Workshop Notebook - 2000	Unclassified	$100.00 (Free to Gov't)
Survivability Systems Master Plan	Unclassified	$ 50.00 (Free to Gov't)
Testing of Aircraft or Aircraft Surrogates with On-Board Munitions	Unclassified	$100.00
"Threat Effects in Aircraft Combat Survivability" Video	Unclassified	$150.00 or 60-Day Loan
Threat Warheads and Effects/Battle Damage Assessment and Repair Archival and Retrival (TWE/BDAR) System	Unclassified	$300.00
Ullage Explosion Hazard State-of-the-Art Report (SOAR)	Unclassified	$200.00
Unmanned Aerial Vehicles Survivability Compendium—Interim Report Database	Unclassified	$200.00
U.S. Air Force Surface-To-Air Engagements During Operation Desert Storm	SECRET	$100.00 (Free to Gov't)
Vulnerability Reduction Design Guide for Ground Systems in a Conventional Combat Environment	Unclassified	$200.00

For further information on how to obtain these products and how to establish need-to-know certification, please contact SURVIAC at (937) 255-4840 or DSN 785-4840. Requests from non-U.S. agencies must be forwarded to their country's Embassy in Washington DC, Attn: Air Attache's Office.

SURVIAC Model Availability

SURVIAC is a U.S. Department of Defense Information Analysis Center (IAC) sponsored by the Defense Technical Information Center (DTIC)

Model	Classification	Reproduction & Handling Fee	
		Model	Documentation
AIRADE 7.4—Airborne Radar Detection Model	Unclassified	$500.00	$ 36.00
ALARM 4.4.1—Advanced Low Altitude Radar Model (Includes EARCE 2.4)	Unclassified	$500.00	$ 50.50+
BLUEMAX IV—Variable Airspeed Flight Path Generator	Unclassified	$500.00	$ 15.00+
BRAWLER 6.4—Air-To-Air Combat Simulation	SECRET	$500.00	$231.50+
*BRL-CAD 5.3—Ballistic Research Laboratory Computer-Aided Design Package	Unclassified	$500.00	N/A
**COVART 4.3—Computation of Vulnerable Area and Repair Time	Unclassified	$500.00	$ 37.00
DIME 2.1—Digital Integrated Modeling Environment	Unclassified	$500.00	$ 63.00
ESAMS 3.0—Enhanced Surface-To-Air Missile Simulation	SECRET	$500.00	$295.50+
**FASTGEN 4.7—Fast Shotline Generator	Unclassified	$500.00	$ 52.00
FATEPEN—Fast Air Target Encounter Penetration Program	Unclassified	$500.00	TBA
IVIEW 2000—Graphical User Interface for Output Simulation	Unclassified	$100.00	+
JSEM - Joint Service Endgame Model	Unclassified	$500.00	TBA*
LELAWS 3.0—Low Energy Laser Weapons Simulation	Unclassified	$500.00	$ 31.50
MIL-AASPEM 5.1 — Man-in-the-Loop Air-To-Air System Performance Evaluation Model	Unclassified	$500.00	$ 80.00+
RADGUNS 2.3—Radar-Directed Gun System Simulation	SECRET	$500.00	$ 59.50+
TRAP 3.1a—Trajectory Analysis Program	Unclassified	$500.00	$256.00
TRACES 1.0—Terrain/Rotorcraft Air Combat Evaluation Simulation	Unclassified	$500.00	$127.00

* For more information regarding BRL-CAD or JSEM documentation contact Mr. Bob Strausser at the SURVIAC Aberdeen Satellite, Office, (410) 273-7722.

**Model is now part of the Vulnerability Tool Kit

+ Documentation included with code on CD version of Model at no charge

Models

For further information on how to obtain these models and how to establish need-to-know certification, please contact SURVIAC at (937) 255-4840 or DSN 785-4840. Requests from non-U.S. agencies must be forwarded to their country's Embassy in Washington DC, Attn: Air Attache's Office.

Aircraft Survivability 2002 Symposium to Address UAV Survivability

Unmanned Air Vehicle (UAV) combat survivability will be examined during a forthcoming symposium, "Combat Survivability: UAVs and Manned Aircraft", jointly sponsored by the National Defense Industrial Association (NDIA) and the Association for Unmanned Vehicle Systems International (AUVSI), at Monterey, California, November 18-21, 2002. The Combat Survivability Division of NDIA holds its aircraft survivability symposium annually at the Naval Postgraduate School, Monterey. The 2002 symposium's theme acknowledges the increasing importance of unmanned aerial vehicles to the armed forces, as well as the growing attention being paid to their survivability, and provides a natural opportunity for NDIA and AUVSI to work together on the event. The symposium proceedings will be classified Secret-US Only.

The broad purpose of the event is to foster improved communications and exchange of survivability technical information between the manned and unmanned aircraft communities. To meet this objective, senior speakers will discuss the role of UAVs in modern warfare and survivability requirements for future manned and unmanned systems. In addition, experts from government and industry will cover various aspects of UAV and manned aircraft survivability technologies, and a special session on the war in Afghanistan will be presented.

Technical presentations will address the following three focus areas:

UAV Systems - This area will acquaint attendees with characteristics and employment concepts for UAVs, with emphasis on survivability.

- UAV roles, missions and CONOPS
- Designing and testing UAVs for survivability
- Interoperability of manned and unmanned systems

Manned Aircraft Survivability - Presentations in this area will apprise the UAV community of survivability technologies, design approaches and testing applied to manned aircraft. This topic includes survivability updates for operational aircraft and those in acquisition.

- Tradeoffs among vulnerability reduction, stealth and countermeasures
- Survivability of fighters, bombers, helicopters, tankers and transports
- Survivability of commercial aircraft

Survivability Technology Trends - This session will highlight new developments in survivability technology for manned and unmanned systems. Presentations on novel or unconventional approaches to enhancing survivability are expected.

- Susceptibility reduction across the spectrum: RF, IR, acoustic and visual
- Reducing vulnerability to guns, missile warheads, chemical weapons and biological weapons
- Advances in survivability testing

The symposium begins on Monday, November 18th, with a day of tutorial sessions offered by experts in fields of interest to the survivability community. The symposium proper commences on Tuesday, November 19th and continues until mid-day on Thursday, November 21st.

Individuals interested in attending should check the NDIA web page (www.ndia.org) or call (703) 522-1820 to obtain additional information and ensure receipt of a detailed symposium brochure.

October 2002

39th Annual AOC Convention and Symposium
27-30 October 2002
Nashville, Tennessee
POC: AOC, (703) 549-1600 or (888) OLD-CROW, www.crows.org

Aircraft Fires and Explosions Due to Accidents, Combat, and Terrorist Attacks
29 October - 1 November 2002
Woburn, Massachusetts
POC: BlazeTech Corp., N. Albert Moussa, (617) 661-0700 ext. 10, E-mail: amoussa@blazetech.com
www.blazetech.com

November 2002

JIMM Users Group and CRB Meeting
4-8 November 2002 (Note: CRB 4, 5, 8 Nov.; Users 6, 7 Nov.)
Kirtland AFB, New Mexico
POC: SURVIAC, Paul Jeng, (937) 255-3828 x273, DSN: 785-4840 x273
E-mail: surviacmodels@bah.com

AIAA Missile Sciences Conference
5-7 November 2002
Monterey, California
POC: AIAA, (703) 264-7500 or (800) 639-AIAA, E-mail: custserv@aiaa.org

12th Annual Aircraft Fire Protection/Mishap InvestigationCourse
8 November 2002
Dayton, Ohio
POC: Robert Clodfelter, (937) 435-8778; E-mail: afp1fire@aol.com
http://members.aol.com/afp1fire/course-12.htm

IAC Business Meeting
12 November 2002
Colorado Springs, Colorado
POC: Battelle, Tim Dixon or Stephanie Pursel, (410) 569-0200
E-mail: dixon@battelle.org or pursels@battelle.org

Suppression of Enemy Air Defense
18-20 November 2002
Stockholm, Sweden
POC: AOC, (703) 549-1600 or (888) OLD-CROW, www.crows.org

2002 NDIA Aircraft Survivability Symposium - "*Combat Survivability: UAVs and Manned Aircraft*"
18-21 November 2002
Monterey, California
POC: NDIA, Event #3940, Ann Saliski at (703) 247-2577, E-mail at asaliski@ndia.org,
http://www.ndia.org

73rd Shock & Vibration Symposium
18-22 November 2002
Newport, Rhode Island
POC: SAVIAC, Joel Leifer, (301) 596-0100, E-mail: joel.leifer@saviac.org

Brawler & ESAMS Users Group Meeting
19-20 November 2002
Nellis AFB, Nevada
POC: SURVIAC, Paul Jeng, (937) 255-3828 x273, DSN: 785-4840 x273
E-mail: surviacmodels@bah.com

For additional conferences visit our website at http://iac.dtic.mil/surviac

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